

Amendments to the Specification

IN THE ABSTRACT OF THE DISCLOSURE

Attached hereto is a replacement Abstract with markings to show amendments.

IN THE WRITTEN DESCRIPTION

Please replace the paragraph beginning at page 9, line 11, with the following rewritten paragraph:

However, it is apparent that if coal and CaO in the form of impalpable powders can be fed into the reactor, this will be more efficient than a case of ~~palletizing~~pelletizing coal and CaO after pulverization.

Please replace the paragraph beginning at page 9, line 22, with the following rewritten paragraph:

As a result of trying various processes as for conditions causing grain growth to occur in the main reactor even if the mixed impalpable powders are small in grain size, it has been found out that grain growth as desired occurs to the impalpable powders of coal and CaO by causing the mixed impalpable powders of coal powders and CaO to undergo ~~gain~~grain growth in the fluidized bed while adjusting a steam partial pressure in the main reactor, thereby leading to development of the present invention.

Please replace the paragraph beginning at page 12, line 10, with the following rewritten paragraph:

First, CaO reacts with H₂O at the inlet of the furnace to be turned into Ca(OH)₂, thereby generating heat. Coal makes use of the heat, and undergoes thermal decomposition, forming gas, tar, and char. Thereafter, Ca(OH)₂, and char powders, together with granulated particles, are fluidized in the furnace. In the fluidized bed, Ca(OH)₂ absorbs CO₂ and H₂S to thereby form CaCO₃ and CaS, further generating heat. ~~By~~By making use of the heat, tar and char react with steam to be gasified, thereby forming CO and hydrogen. As a result of

various reactions such as reaction of CO with steam, thereby forming H_2 and CO_2 , highly concentrated hydrogen is finally formed. The granulated particles after the reactions are discharged from the fluidized bed and the gasification furnace to thereby regenerate CaO in a roasting furnace (CaO regenerator) so as to be utilized again as an absorbent. Further, since the reaction of $CaCO_3 \rightarrow CaO$ proceeds in the roasting furnace (CaO regenerator), pure carbonic acid gas can be recovered. In addition, since the main reactor is of a moving bed type, not only gas and liquid but also solids can be taken out while keeping reactions proceeding. Also, the outer wall of the main reactor is kept at not higher than $600^\circ C$. It is necessary to prevent $CaCO_3$ from precipitating on the inner wall of the main reactor. As coal, for example, contains sulfur, sulfur can be arrested in the main reactor by use of one species or not less than two species in combination, selected from the group consisting of NaOH, Na_2CO_3 , KOH, and K_2CO_3 , however, desulfurization may be performed by the conventional method.